



Board of Regents, State of Iowa

# Mathematics and Science Education Collaborative Initiative



## Board of Regents Mathematics and Science Education Collaborative Initiative

Goals:

- 1) To improve mathematics and science performance of Iowa students.
- 2) To prepare more high-quality mathematics and science teachers for Iowa's schools.
- 3) To promote statewide collaboration and coordination.

## FY 2009 Legislative Appropriations Request for Math & Science Education Initiative - \$5.5 million

The state and the nation are facing unprecedented challenges in math and science education.

### Challenges across Iowa and the U.S.

- Of the 20 fastest-growing occupations of the 21st century, 15 require substantial mathematics and science preparation. [Rising Above the Gathering Storm, National Academies of Science, 2006]
- In the State of Iowa, the three industry sectors of Iowa's new economy, bioscience, advanced manufacturing, and information solutions, all require substantial mathematics and science preparation. The foundation of those skills is built during the pre-K through 12 years. [Iowa Department of Economic Development, 2006].
- In 2006-07, Iowa was 173 teachers short in Science and 121 teachers short in Mathematics. [Iowa Department of Education *Task Force on Teacher Shortage*, Dec. 2006].
- Shortage of math and science teachers in Iowa; retention of current math and science teachers; awareness of business and industry applications of math and science; quality curriculum for teaching math and science; shortage of community college STEM instructors to meet growing demand for dual credit and community college enrollment. [State of Iowa, Board of Regents Math & Science Education Summit, July 11, 2007]

- The report "Rising Above the Gathering Storm" also projects that by 2015, we will see a shortage of 283,000 highly-qualified math and science teachers for pre-K through 12, with the shortage being more pronounced in rural, low-income, and urban areas.
- In 2006-07 Iowa had 93 physics teachers eligible for retirement; only 14 entered the profession from Iowa colleges and universities. [Iowa Department of Education Director Judy Jeffrey, July 11, 2007.]
- Since 2000, engineering majors at U.S. universities have declined 20 percent; by 2010 an estimated 90 percent of all scientists and engineers will live in Asia. [Tapping America's Potential: The Education for Innovation Initiative, July 2005].
- Across Iowa, about 17 percent of upperclassmen take higher level math courses (trigonometry, pre-calculus, calculus, etc.) [The Annual CONDITION OF EDUCATION Report of the Iowa Department of Education, 2006].
- As of 2006, 26.3 percent of Iowa students took physics; 22.5 percent took a computer course; two thirds took chemistry. [The Annual CONDITION OF EDUCATION Report of the Iowa Department of Education, 2006].
- Nationally, about one-third of the 4th graders and one-fifth of the 8th graders lack the competence to perform even basic mathematical computations. [National Assessment of Educational Progress Test]
- In science, only one-third of 4th and 8th graders scored at the proficiency level and nearly one-half of the high school seniors did not reach the basic level of competence. [National Assessment of Educational Progress Test]



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### **Regents Mathematics and Science Education Institute**

The Institute will be located at UNI in collaboration with the University of Iowa and Iowa State University. The Institute leverages state collaborations and partnerships between businesses, industries, government agencies, education and other organizations to address student learning and teacher recruitment and retention in math and science. Sample activities include:

- Research center providing empirical basis for STEM teaching innovations.
- Mentorship coordination for new math/science teachers in Iowa.
- Design and implementation of elementary math/science specialist degree programs at Regent universities.
- Expand and enhance professional development opportunities for math and science teachers.
- Math/science curriculum development, piloting, validation, and dissemination.
- Advise and consult policy makers on issues of math and science education at Regent universities.
- Gather and coordinate information on activities of Iowa universities, businesses, industries, governmental agencies, private and community colleges, non-governmental organizations, and pre-K through 12 schools in math and science education.

### **Star Math and Science Majors to Teaching**

Program recruits students into math and science teaching to address the teacher shortage. Provides incentives to freshman and sophomore college students in math and science to explore teaching. Targets under-represented populations, rural and urban placements. Attracts students early in their career.

### **Science and Math Teacher Real World Internships**

Summer-long paid internships in the private and public sector for math and science. Focus is on retention of math and science teachers, modernizing curriculum and facilitating on-going relations with professionals. The program offers credit toward licensure for those teaching out of field.

### **Project Lead The Way (PLTW)**

Funding will provide wider implementation across Iowa. PLTW is an established, national pre-engineering program that works with middle and high school curriculum. Focuses on student recruitment to math and science careers. Certified engineering faculty train teachers at Iowa high schools and middle schools; pre-engineering high schools courses are introduced; middle school pre-engineering modules are incorporated into science, technology and mathematics courses.

### **Community College STEM Instructor Preparation and Updates**

Addresses shortage of instructors at community colleges. Provides more distance-education math and science courses; launch of a special STEM learning and teaching community college teaching certificate program; on-site and on-line delivery of courses; serves as a template for other community college certification programs at Regent universities.

For more information visit, [www.uni.edu/pres/math-science](http://www.uni.edu/pres/math-science).

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